

**Article XVI.—NEW FOSSIL MAMMALS FROM THE FAYÛM
OLIGOCENE, EGYPT.**

BY HENRY FAIRFIELD OSBORN.

Through the generosity of President Morris K. Jesup the Museum was enabled to send a party into the Fayûm region of northern Egypt in the winter of 1906–1907 under the direction of the writer. Capt. H. G. Lyons, Director of the Geological Survey, coöperated with the plans of the party most heartily, facilitated the work of outfitting, and especially extended the privilege of excavation in the quarries located by Messrs. Beadnell and Andrews. Mr. Hartley T. Ferrar of the Survey was detailed to accompany the writer on a three weeks' reconnoissance of the famous fossil bearing region, with the object of determining the horizons and visiting the principal localities where discoveries had been made. Mr. Walter Granger, assisted by Mr. George Olsen, both of the American Museum of Natural History staff, remained in charge until June 14, and displayed energy and skill in the work of collection. Herr Richard Markgraf, who had already had considerable experience in this work in the Fayûm in the service of Professor Eberhard Fraas of Stuttgart, and others, joined the party and rendered valuable aid. The Museum is also indebted to Mr. Hugh J. L. Beadnell, formerly of the Survey, to Mr. Charles W. Andrews of the British Museum, and to Professor Fraas for valuable advice given by letter. Our most grateful acknowledgments are due to Director Lyons, also to Messrs. H. T. Ferrar, W. F. Hume and A. Lucas of the staff of the Geological Survey for the cordial coöperation which materially contributed to the successful results which were obtained.

The present paper is a preliminary notice of the results obtained.

Our collection numbers about 550 specimens, as catalogued by Mr. Granger, including more or less complete remains of most of the fossil forms so far known to be characteristic of this region. A number of new forms related to those already described by Andrews were discovered.

The hope that exceptionally careful methods of search might result in a substantial addition to the Fayûm fauna was realized by the discovery of three of the smaller kinds of mammals which had hitherto escaped the eyes of collectors, representing especially the Rodentia and members of two other mammalian orders which are not determinable at present.

Another important result was the finding of additional fossils on the high-level fossil-bearing stratum in the upper or Fluvio-Marine Beds. It

was in these beds that two of the new forms were found. These beds were regarded as Upper Eocene by Andrews, but are considered of Oligocene age by Stromer (1907).

This brief preliminary description will be followed by a fuller narrative and exposition of the chief results of our work.

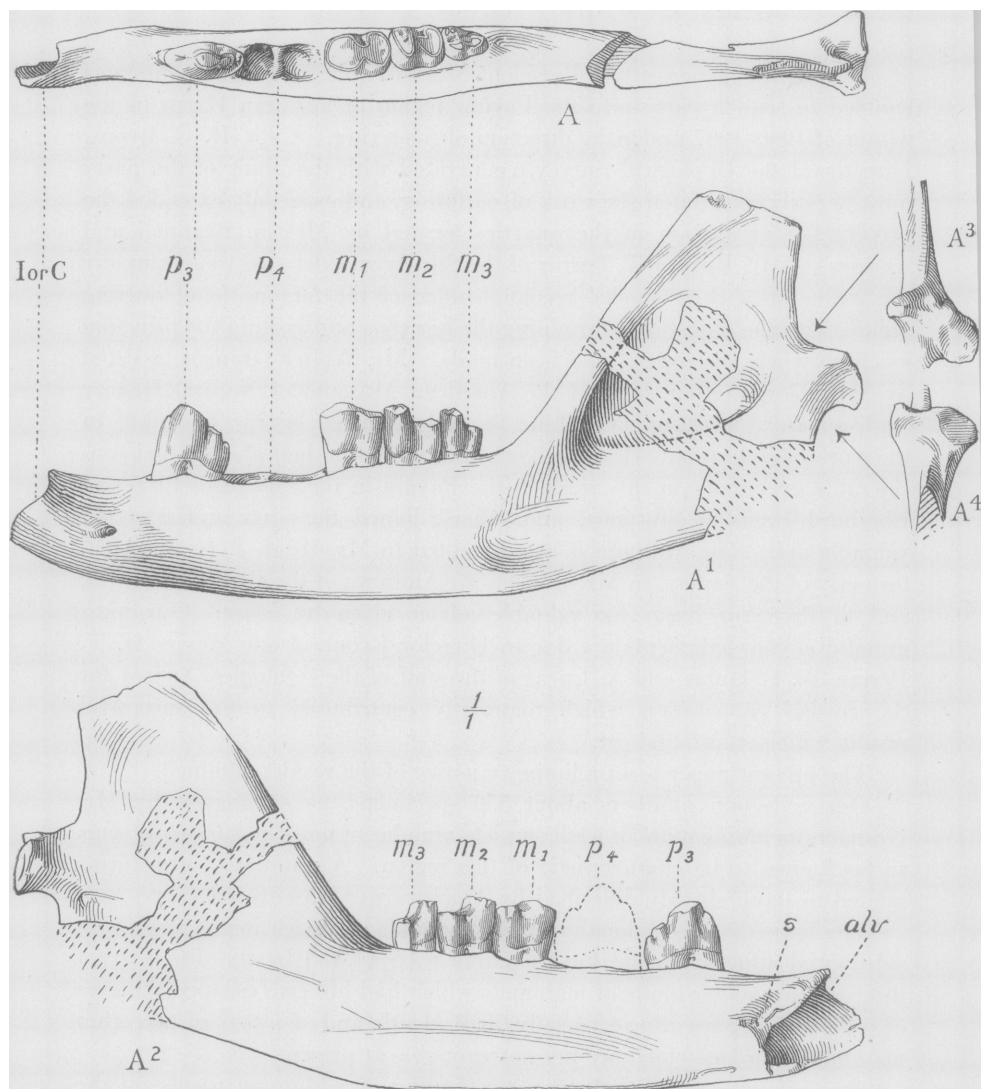


Fig. 1. *Ptolemaia lyonsi* Osborn. Type, Amer. Mus. No. 13269. Left mandibular ramus. A, superior; A¹, external; A², internal; A³, superior view of condyle and coronoid process; A⁴, posterior view of same. All $\frac{1}{1}$.

OF UNCERTAIN ORDINAL POSITION.

PTOLEMAÏIDÆ fam. nov.

Ptolemaia lyonsi gen. et. sp. nov.

This problematic form is named after the famous Greek family which ruled the region. The specific name is given in honor of Director Lyons of the Survey.

The type specimen is the left ramus of a lower jaw (Amer. Mus. No. 13269) which was found in the smaller of the two main quarries previously worked by the Survey, which we shall designate as Quarry A.

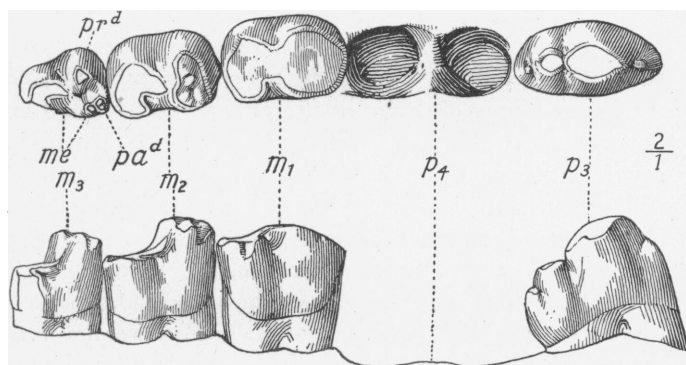


Fig. 2. *Ptolemaia lyonsi* Osborn. Type, Amer. Mus. No. 13269. Superior and internal view of inferior teeth. $\frac{2}{1}$.

Characters.—I or C1, P2, M3. The large anterior tooth, either an incisor or a canine, probably the latter, was laterally compressed, with its closed fang closely approximated to the symphysis. The alveolus is followed by a wide diastema in which no traces of the first or second premolars remain.

The third premolar is laterally compressed, with two fangs and a high crown, backwardly directed and supporting a single main cone, a smaller posterior cone, and anterior and posterior basal cuspules. The fourth premolar (missing in this specimen) was evidently a much larger tooth but probably of the same general form as the third.

There are no cingula on either the premolars or molars.

The three true molars are also bifanged, and decrease regularly in size posteriorly. The enamel is well developed. The crowns of m_1 and m_2 are considerably worn; that of m_3 exhibits the coronal pattern, which con-

sists of an elevated trigonid supporting three cusps, an external protoconid, and two internal and closely compressed cusps (para- and metaconids); the talonid is more depressed and probably supported an inner and an outer cusp (entoconid and hypoconid). Lateral vertical grooves on the sides of the crowns separate the trigonid from the talonid in each of these teeth.

The ramus is long and shallow. The mental foramen is anteriorly placed below the diastema. The coronoid process is relatively large. The condyle is extended transversely and expanded on the inner side.

Affinities.—This evidently represents a new family of mammals, to which the name **Ptolemaïdæ** may be given. It possibly represents a new order of mammals which will be defined by the writer if additional materials are found. It is obviously not a primate. The large size of the coronoid, depressed position of the condyle, subtrenchant characters of the premolars, enlarged cutting teeth and tuberculo-sectorial molar teeth, relate it rather to the ungulate than to the ungulate division of placentals. The elevated trigonid and depressed talonid belong to a primitive stage characteristic of insectivores and creodonts; the dentition does not resemble, however, that of any known form of Ungulate, either Insectivore, Carnivore, Creodont, or Edentate. The laterally compressed premolars with cuspules all in the same line suggest those of the Pinnipedia; but the dental formula is entirely different from that of the Pinnipedia. Certain Creodonts have a series of homologous cusps on the premolar teeth but in these carnivores the main cusp exhibits a piercing character which is lacking in this type.

While the anterior teeth of *Ptolemaia* may have been adapted to the prehension of an active prey, the premolar and molar teeth are not in the least of a carnivorous or sectorial character. In fact it is difficult to surmise the adaptation of these teeth.

Thus with our knowledge limited to this imperfect type specimen we cannot offer any reasonable suggestion either as to the habits or affinities of *Ptolemaia*.

RODENTIA.

? Suborder MYOMORPHA.

Fam. EOMYIDÆ.

The discovery in the Upper or Fluvio-Marine beds (Oligocene) of the diminutive jaws and teeth of rodents was a most welcome one. The affini-

ties are apparently with certain Lower Oligocene rodents of Europe which have been provisionally referred to the Myomorpha. Two distinct generic types were found, namely: *Phiomys*, in the lower fossiliferous level, Quarries A, and B, of the Fluvio-Marine Beds; *Metaphiomys*, in the upper or higher fossiliferous level, of the Fluvio-Marine Beds.

***Phiomys andrewsi* gen. et sp. nov.**

The type is the right ramus of a lower jaw (Amer. Mus. No. 13275) containing a fourth premolar and three molars, and the paratypes are three other jaws, No. 13274 adult, Nos. 13271, 13272 juvenile. The generic name is after 'Phiom' the Greek designation of the Fayûm. The specific name is in honor of Charles William Andrews, the monographer of the Fayûm fauna.

In the type the crowns of the grinding teeth are well preserved. The molars are brachyodont. The fundamental pattern consists of four tubercles (apparently the protoconid, metaconid, hypoconid, entoconid) with a fifth posterior median tubercle (hypoconulid); transverse crests and spurs form backwardly opening crescents connecting these tubercles; a delicate median spur extends into the main valley between the metaconid and entoconid, as clearly shown in the enlarged drawing, Fig. 3. The fourth premolar is a rounded tooth, with an incipient molariform pattern. In the juvenile paratypes (Nos. 13271, 13272), dp_4 is preserved as a relatively elongate or narrow tooth.

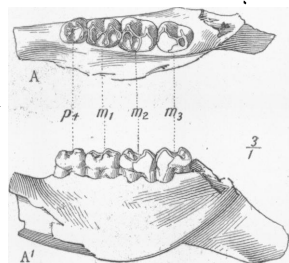


Fig. 3. *Phiomys andrewsi* Osborn. Type, Amer. Mus. No. 13275. Portion of right mandibular ramus. ♂.

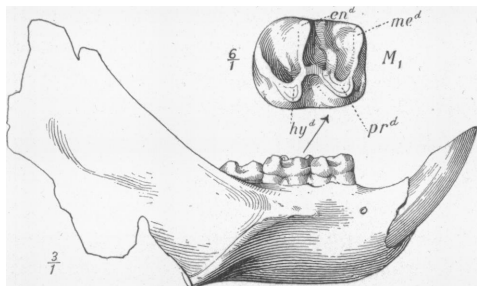


Fig. 4. *Phiomys andrewsi* Osborn. Paratype, Amer. Mus. No. 13271. Portion of right mandibular ramus. ♀. First molar, ♀.

the jaw, as figured by Schlosser and Zittel (*Handbuch der Paläontologie*, Band IV, p. 527, Fig. 439 A & B). Both of these genera were placed by

Schlosser (Die Nager des Europäischen tertiärs, Paläontographica, Band 31, 1884, pp. 84–90, Tafel 8, Figs. 17, 24) in the Myomorpha.

The resemblances to Myomorpha of the Phosphorites of Europe are consistent with the presence in the Fayûm, found in the same quarries with the Rodents, of hyænodonts belonging to the genera *Pterodon* and *Apterodon*, which are both characteristic of the Lower Oligocene of France. There is thus little doubt that we have here remains of a rodent family common to northern Africa and central France at this period.

The jaw (Amer. Mus. No. 13271) exhibits a strong masseteric crest rising obliquely beneath the grinding teeth. This jaw contains dp_4 . The pattern of the molar teeth is similar to that of the molars in the type and is very perfectly displayed (Fig. 4) as consisting of two transverse crests with subcrescentic disposition.

Comparison.—The fourth premolar of *Phiomys* is simpler than that of *Eomys*, and the molars are more elongate. In *Eomys* the molars are antero-posteriorly compressed and subquadrate in contour, and the fourth premolar contains two distinct transverse lobes.

***Metaphiomys beadnelli* gen. et
sp. nov.**

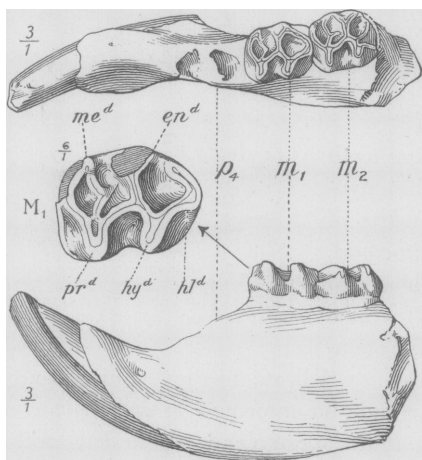


Fig. 5. *Metaphiomys beadnelli* Osborn. Type, Amer. Mus. No. 13273. Portion of left mandibular ramus, ♀. First inferior molar, ♀.

The type of this species (Amer. Mus. No. 13273) was found on the upper level of the Fluvio-Marine beds, on the bench above quarries A and B, in which the types of *Phiomys andrewsi* were obtained, and about 200 feet below the basalt layer. The specific name is in honor of Hugh J. L. Beadnell, geologist, who first explored this region for the Survey.

The molar teeth are of fundamentally similar pattern to those of *Phiomys* but of very much more progressive and complex character, suggesting rather those of *Sciuroides quercyi* and of some species of *Cricetodon* figured by Schlosser. The surface of the crown is elaborately crested and cupped, whereas in *Phiomys* it is rather disposed into two transverse ridges with low connecting crests, as in the typical Myomorpha.

As best seen in m_1 , there are four main tubercles and a posterior median tubercle (protoconid, metaconid, hypoconid, entoconid, hypoconulid) all

connected by crests. A median spur also extends into the median valley between the metaconid and entoconid, and the crest connecting the hypoconid and entoconid bifurcates on the inner side, giving the crown a very complex pattern, which is intensified by the crest connecting the entoconid, hypoconulid, and hypoconid.

OF UNCERTAIN ORDINAL AND FAMILY POSITION.

Apidium phiomensis gen. et sp. nov.

The type (Fig. 6) is the middle portion of the ramus of a left lower jaw

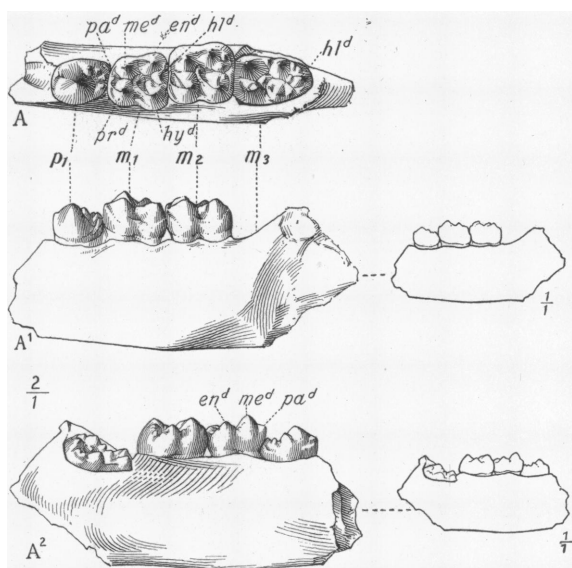


Fig. 6. *Apidium phiomensis* Osborn. Type, Amer. Mus. No. 13370. Portion of left mandibular ramus. A, superior; A¹, external; A², internal. Shaded figures, 1; outline figures, 2.

(Amer. Mus. No. 13370) containing the fourth premolar and three true molars. It was found on the *upper* levels of the Fluvio-Marine beds. The fanciful name *Apidium* is in reference to the sacred bulls of Apis.

Characters.—The size is inferior to that of *Acotherulum saturninum*, and the characters of the teeth are quite distinct generically. The molars are essentially low-crowned, or brachyodont, with the cuspules in opposite pairs, and the trigonids and talonids are on the same level and multicuspitate, that is, with numerous supplementary cusps. The fourth premolar is

a suboval tooth with large anterior cone bearing anterior and posterior accessory cusps on its inner surface and a depressed talonid region bearing three or four accessory cuspules. The first molar exhibits five main cusps (protoconid, metaconid, hypoconid, entoconid, hypoconulid) and a vestigial paraconid. There is also a small cusp directly in the center of the crown, a very unusual feature. The second molar is a somewhat larger tooth with similar characters except that the paraconid is entirely wanting. The third molar is elongate with the four main cusps surrounding the central cusp and with a posterior extension of the heel, or hypoconulid, reinforced by a number of accessory cuspules.

The generic name, *Apidium*, does not imply any indication of the affinities of this animal to the Artiodactyla, or even to the Suoidea. Comparisons are suggested with certain species of the Upper Eocene *Cebochærus* and *Acotherulum*, but this animal is of more diminutive size. It was evidently a small omnivorous or frugivorous form with partly cuspidate teeth. It might be placed near *Acotherulum* among the diminutive bunodont Artiodactyla except for the rounded form of p_4 , a tooth which in the Artiodactyla generally is laterally compressed. Comparisons with *Cebochærus* show equally wide differences. Reference to the primates is equally uncertain because the teeth do not agree with those of any Eocene or Oligocene primate known. Until the anterior teeth are discovered we must remain in the dark as to the affinities of this animal.

FAUNA OF THE UPPER LEVEL.

The mammals collected on the *upper* fossiliferous level are provisionally determined as follows:

Arsinoitherium sp. indet.

Metaphiomys beadnelli.

Apidium phiomensis.

Apterodon macrognathus.

Ancodon gorringei.

Ancodon (?) *minus*.

? *Geniohyus*.

Megalohyrax eocænus.